

CLAIMS:

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1. A capacitor fabrication method comprising:

electrode having an inner surface area per unit area and an outer surface area per unit area that are both greater than an outer area per unit area of the substrate;

forming a capacitor dielectric layer over the first electrode; and

TiN.

73. The method of claim 1 further comprising forming rugged polysilicon over the substrate, the first electrode being over the rugged polysilicon.

4. The method of claim 3 wherein the rugged polysilicon is undoped.

, 5. The method of claim 3 wherein the rugged polysilicon comprises hemispherical grain polysilicon.

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The method of claim 3 wherein the forming the rugged polysilicon comprises using a seed density sufficiently small to yield at least some spaced apart grains.

7. The method of Paim 1 wherein the outer surface area of the first electrode is at least 30% greater than the outer surface area of the substrate.

8. The method of claim 1 wherein the forming the first electrode comprises:

chem sorbing a layer of a first precursor at least one monolayer thick over the substrate;

thick on the first precursor layer, a chemisorption product of the first and second precursor layers being comprised by the first electrode.

9. The method of claim 1 wherein the dielectric layer comprises Ta_2O_5 , ZrO_2 , WO_3 , Al_2O_3 , HfO_2 , barium strontium titanate, or strontium titanate.



10. A capacitor fabrication method comprising:

forming an opening in an insulative layer over a substrate, the opening having sides and a bottom;

forming a layer of polysilicon over the sides and bottom of the opening;

removing the polysilicon layer from over the bottom of the opening;

grain polysilicon;

conformally forming a first capacitor electrode on the converted polysilicon, the first electrode being sufficiently thin that the first electrode has an outer surface area per unit area greater than an outer surface area per unit area of the substrate underlying the first electrode; forming a capacitor dielectric layer on the first electrode; and forming a second capacitor electrode over the dielectric layer.

The method of claim 10 wherein the hemispherical grain polysilicon is undoped.

The method of claim 10 wherein the converting the polysilicon comprises using a seed density sufficiently small to yield at least some spaced apart grains.

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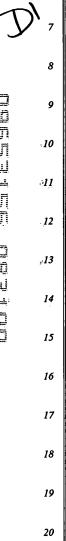
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electrode	compri	ses:						·		

chemisorbing a layer of a first precursor at least one monolayer thick on the converted polysilicon;

chemisorbing a layer of a second precursor at least one monolayer thick on the first precursor layer, a chemisorption product of the first and second precursor layers being comprised by the first electrode.

The method of claim 10 wherein the first electrode comprises

method of claim 10 wherein the dielectric layer comprises Ta_2O_5 , ZrO_2 , WO_3 , Al_2O_3 , HfO_2 , barium strontium titanate, or strontium Ititanate.

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1	16. A capacitor construction comprising:
2	a first capacitor electrode over a substrate, the first electrode
.3	having an inner surface area per unit area and an outer surface area per
4	unit area that are both greater than an outer surface area per unit area
5 .	of the substrate;
6	a capacitor dielectric layer over the first electrode; and
7	a second capacitor electrode over the dielectric layer.
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9	17. The construction of claim 16 wherein the first electrode
10	comprises TiN.
11	<i>,</i>
12	18. The construction of claim 16 further comprising rugged
13	polysilicon over the substrate, the first electrode being over the rugged
14	polysilicon.
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16	19. The construction of claim 18 wherein the rugged polysilicon
17	is undoped.
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19	20. The construction of claim 18 wherein the rugged polysilicon
20	comprises spaced apart grains.
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21. The construction of claim 16 wherein the outer surface area of the first electrode is at least 30% greater than the substrate outer surface area.

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1	22. A capacitor construction comprising:
2	an opening in an insulative layer over a substrate, the opening
3	having sides and a bottom;
4	a hemispherical grain polysilicon layer over the sides of the
5	opening but not over the bottom;
6	a conformal first capacitor electrode on the polysilicon, the first
7	electrode being sufficiently thin that the first electrode has a rugged
8	outer surface with an outer surface area per unit area greater than an
9	outer surface area per unit area of the substrate underlying the first
10	electrode;
11	a capacitor dielectric layer on the first electrode; and
12	a second capacitor electrode over the dielectric layer.
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14	23. The construction of claim 22 wherein the polysilicon is
15	undoped.
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17	24. The construction of claim 22 wherein the polysilicon
18	comprises spaced apart grains.
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20	25. The construction of claim 22 wherein the first electrode
21	comprises TiN.
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26. The construction of claim 22 wherein the dielectric layer and comprises Ta₂O₃, ZrO₂, WO₃, Al₂O₃, HfO₂, barium strontium titanate, or strontium titanate